

***STAPHYLOCOCCUS AUREUS* with RESISTANCE TO VANCOMYCIN (VISA/VRSA)**

Infection Control Guidelines for Long-Term Care Facilities

Massachusetts Department of Public Health
Division of Epidemiology and Immunization
(617) 983-6800

Since the recognition of vancomycin-resistant enterococci (VRE), the emergence of vancomycin-resistant *S. aureus* (VRSA) has been anticipated. In May 1996, the first documented case of a methicillin-resistant *S. aureus* infection that demonstrated intermediate resistance to vancomycin (VISA) was described in Japan. In August 1997, the first case of VISA in the United States was reported. The emergence of *S. aureus* with reduced susceptibility to vancomycin presents the potential for infection with a virulent organism for which therapeutic options are severely limited.

VRSA and VISA may also be referred to as GRSA or GISA, glycopeptide resistant or intermediate. Vancomycin is one of several glycopeptide antibiotics and resistance to this class of agents tends to be uniform.

Infectious Agent: A strain of *S. aureus* that is resistant to most antibiotics, including having **intermediate or greater resistance to vancomycin**.

Reservoir: Colonized and infected patients. The anterior nares are a common reservoir site. To a lesser degree, colonized healthcare workers may also serve as a reservoir.

Modes of Transmission: Person-to-person contact, for example, via transiently colonized hands of staff. Fomites such as bed linens or environmental surfaces may also play a role in transmission in certain circumstances. Cleaning and disinfection of these items is necessary to reduce bacterial load and risk of transmission. Since the hands of staff appear to be the most likely mode of transmission of MRSA from patient to patient, this may also be the most likely mode of transmission of VISA/VRSA.

Incubation Period: Variable.

Common risk factors for acquiring VISA/VRSA:

- already infected or colonized with MRSA
- undergoing renal dialysis
- long-term use of vancomycin

Diagnosis: VISA/VRSA infection can be diagnosed by positive culture together with signs/symptoms of infection. Theoretically, VISA/VRSA can be cultured from the same places as MRSA: blood, wounds, respiratory secretions, urine, and specimens obtained via surgical intervention. Sites of infection (and colonization) could include wounds, tracheostomy sites, respiratory tract of intubated patients, and IV catheter sites. Colonization can be detected by culture of the organism from an asymptomatic patient. **After *S. aureus* is identified, antibiotic susceptibilities should be performed.**

Certain patient populations, such as hemodialysis patients, intravenous drug users, those with dermatological diseases such as eczema, and patients with insulin-dependent diabetes mellitus, have increased rates of staphylococcal carriage.

Treatment: There are limited treatment options for VISA/VRSA infections. Some possible options include rifampin, gentamicin, imipenem, chloramphenicol, trimethoprim-sulfamethoxazole, and tetracycline. Patients with infections caused by *S. aureus* with reduced susceptibility to vancomycin may be candidates for investigational antimicrobials. Physicians treating infections caused by VISA/VRSA can obtain information about investigational drug therapies by contacting the FDA Division of Anti-Infective Drug Products at (301) 827-2120. The physician will be asked to submit any isolates to CDC for microbiologic and epidemiologic evaluation.

Reporting: Although VISA/VRSA is not currently reportable to the Massachusetts Department of Public Health, the recovery of *S. aureus* with presumptive reduced susceptibility to vancomycin is a critical public health sentinel event and should be reported to the Division of Epidemiology and Immunization at (617) 983-6800.

Submission of Isolates: The CDC is seeking laboratory reports of confirmed cases of VISA/VRSA infection for an ongoing nationwide epidemiologic study. Please contact an epidemiologist at the MDPH Division of Epidemiology and Immunization at (617) 983-6800 for more information.

Control: As with MRSA, an individual with VISA/VRSA can presumably be either infected (showing clinical signs/symptoms, e.g. fever, lesions, wound drainage) or colonized (VISA/VRSA is present in or on a body site without clinical signs/symptoms), and in either case is capable of transmitting it to others.

Precautions: Isolation precautions (strict contact precautions at a minimum) should be implemented according to the type of VISA/VRSA infection or colonization. Standard precautions should be practiced at all times, regardless of VISA/VRSA status.

Gloves: All persons entering the room should wear gloves. In addition, gloves should be worn when coming into contact with items that may be contaminated by VISA/VRSA (e.g., bedding). If, during the course of patient care, gloves become soiled with potentially infectious material (e.g. urine, stool), they should be changed before further contact with clean surfaces, the patient, or other staff.

Remove the gloves after caring for the patient and wash hands with an

antibacterial soap before leaving the room. Gloves alone do not guarantee prevention of transmission.

Gowns: All persons entering the room should wear a gown. The gown should be removed immediately after providing care and the caregiver's hands should be washed prior to leaving the patient's room.

Masks: All persons entering the room should wear a mask in order to prevent nasal colonization. If excessive splattering is expected during a procedure that might generate an aerosol (i.e. suction, sputum induction, bronchoscopy, or aerosol treatment), protective eyewear may be warranted.

Hand hygiene: Strict adherence to hand hygiene protocols must be maintained. Staff and visitors should wash their hands with an antibacterial soap (soap is not as effective in removing transient carriage) after glove removal, after patient care, and prior to leaving the room of a VISA/VRSA -positive resident. Hands should be dried with a dry, disposable paper towel, and faucets should be turned off using a paper towel. Hands should be washed after touching body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Educate staff, residents, and visitors about the importance of hand hygiene. If residents can not wash their own hands after bathroom use, their hands should be washed for them. Recent studies have shown that the use of a waterless, alcohol-based hand antiseptic is as effective as antimicrobial soaps, is not harmful to hands, and may improve compliance; however, these products are not a substitute for handwashing when visible contamination occurs.

Linens: Minimal handling of soiled linens should be stressed. Staff involved with stripping beds or otherwise having direct contact with these materials should wear gloves and gowns. Soiled linens should be bagged in the resident's room.

Environmental Cleaning: Routine cleaning of the resident's surroundings should be done **daily** to reduce bacterial load. Sharing of noncritical items (such as electronic thermometers, blood pressure cuffs, and intravenous poles) should not be permitted. Cleaning supplies should be dedicated to the room. Discard all contaminated disposable supplies after the resident leaves the room, and keep disposable supplies in the room to a minimum. Only plastic, vinyl, or leather-coated furniture that can be wiped down with a disinfectant should go in the room. Bath tubs, whirlpools, and hydrotherapy tubs should be cleaned and disinfected after each use. Solutions of 5.25% sodium hypochlorite (household bleach) diluted to 1:64 with water (1/4 cup bleach to one-gallon water) are acceptable for disinfection of environmental surfaces. Always consult your facility's housekeeping protocols first. There are several other disinfectant products on the market. However, only those that are registered by the Environmental Protection Agency (EPA) as a hospital-grade disinfectant should be used. A list of EPA registered disinfectants may be obtained by calling the Antimicrobial Complaint System at 1-800-447-6349 or by visiting the National

Antimicrobial Information Network (NAIN) at <http://nain.orst.edu/lists.htm>. There are four lists: List A-agents, described as sterilants; List B-agents, effective against Mycobacterium (TB); List C-agents, effective against HIV-1; and List D-agents, effective against Hepatitis B Virus and HIV-1. The lists are maintained by Texas Tech University, which also operates an EPA-sponsored hot line, and are updated annually.

Room Placement: Move the patient to a private room or cohort the patient with other known VISA/VRSA patients. It may be warranted to record the names of all persons who enter the room in case nasal surveillance cultures need to be obtained in the future.

Staff: Limit the number of health care workers caring for VISA/VRSA-infected residents. Health care workers known to be at a higher risk for staphylococcus colonization (e.g., those with exfoliative dermatitis, diabetes mellitus requiring treatment with insulin, those who are immunocompromised, or those known to have a history of *S. aureus* colonization) should not care for patients with VISA/VRSA colonization or infection.

Group Activities: A long-term care facility is generally considered a resident's home. However, until experience is gathered in the management of patient colonization or infection with VISA/VRSA, clear guidelines on group activities cannot be established. It is expected that these guidelines will be the same as they are for VRE and MRSA should VISA/VRSA become endemic problems.

Staff Education: All staff working in a long-term care facility should receive education and training regarding VISA/VRSA and the importance of control. Education should be provided on a regular basis, at least annually. Additionally, enhanced inservice training in infection control should be provided in response to any VISA/VRSA activity within the facility.

OUTBREAK CONTROL

An outbreak may be defined as the occurrence of a disease or condition in excess of what is normally expected. Since the occurrence of VISA/VRSA is rare, even one case would be considered an outbreak situation. In addition to the above recommendations, the following should be conducted in outbreak situations:

1. Notify the Massachusetts Department of Public Health, Division of Health Care Quality at (617) 753-8000 and the Division of Epidemiology and Immunization at (617) 983-6800 immediately.
2. All staff providing direct patient care should be informed of the epidemiologic implications of VISA/VRSA. Reinforce infection control procedures throughout the facility. Infection control personnel should monitor and strictly enforce compliance with contact precautions and other recommended infection control practices.

3. If there is only one VISA/VRSA -positive resident, move that individual to a private room. Staff should be restricted to caring for **only one cohort** of residents. **Restrict floating of staff.**
4. Cultures from the anterior nares and hands should be obtained from all residents in affected units. Staff with signs of staphylococcal infection should be cultured. Asymptomatic staff who have contact with VISA/VRSA-positive patients should also be cultured for colonization (nares, hands, etc.). Culture-positive staff should be assessed on a case-by-case basis following the employee health guidelines of the institution.
5. Institute appropriate strict isolation precautions for the VISA/VRSA-positive resident.
6. Conduct an epidemiologic investigation to the best of your ability. Focus on collecting the following information for each VISA/VRSA-positive patient (case):
 - (a) the patient's location in the facility (before and after cohorting)
 - (b) date(s) of the patient's original and most recent admissions to the facility
 - (c) date(s) of recent admissions/discharges to/from other acute and long-term care facilities
 - (d) which caregivers in the current facility had "hands on" contact with the patient
 - (e) body site(s) of infection/colonization of the patient
 - (f) age, sex, and ethnicity of the patient
 - (g) diagnosis and underlying conditions of the patient
 - (h) treatment given to the patient
7. Avoid transferring infected or colonized residents within or between facilities. If the transfer is necessary, fully inform the receiving institution or unit of the resident's colonization/infection status and appropriate precautions.

REFERENCES

Bischoff WE, Reynolds TM, Sessler CN et al. Handwashing compliance by health care workers. *Archives of Internal Medicine* 2000;160:1017-1021.

Boyce JM. Using alcohol for hand sepsis: dispelling old myths. *Infect Control Hosp Epidemiol* 2000;21:438-441.

Centers for Disease Control and Prevention. Reduced susceptibility of *Staphylococcus aureus* to vancomycin-Japan, 1996. *MMWR* 1997;46(27):624-626.

Centers for Disease Control and Prevention. Interim guidelines for prevention and control of staphylococcal infection associated with reduced susceptibility to vancomycin. *MMWR* 1997;46(27):626-635.

Centers for Disease Control and Prevention. *Staphylococcus aureus* with reduced susceptibility to vancomycin-United States, 1997. *MMWR* 1997;46(33):765-766.

Centers for Disease Control and Prevention. Update: *Staphylococcus aureus* with reduced susceptibility to vancomycin-United States, 1997. *MMWR* 1997;46(35):813-815.

Centers for Disease Control and Prevention. *Staphylococcus aureus* with reduced susceptibility to vancomycin-Illinois, 1999. *MMWR* 2000;48(51):1165-1167.

Edmond M, Wenzel R, Pasculle A. Vancomycin-resistant *Staphylococcus aureus*: perspectives on measures needed for control. *Annals of Internal Medicine* 1996;124:329-334.

Johns Hopkins Hospital Interdisciplinary Clinical Practice Manual. Vancomycin-Resistant *Staphylococcus aureus* (VRSA) and *Staphylococcus aureus* with Intermediate Level Resistance to Vancomycin (VISA). February 1998. www.hopkins-heic.org

Minnesota Department of Health. Guideline for the Management of Antimicrobial Resistant Microorganisms in Minnesota Long-Term Care Facilities. October 2000. www.health.state.mn.us/divs/dpc/ades/infect/guideline.htm

Wenzel R, Edmond M. Vancomycin-resistant *Staphylococcus aureus*: infection control considerations. *Clinical Infectious Diseases* 1998;27:245-251.